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NEWSLETTER OF THE AUSTRALIAN NETWORK FOR PLANT CONSERVATION

CULTIVATING CONSERVATION A CONFERENCE REPORT

BY JOCK MORSE, CSIRO

The first national conference of the Australian Network for Plant Conservation (ANPC), held in Hobart in December, was an excellent opportunity for members and other delegates to get together to discuss progress since the 'Protective Custody?' conference in early 1991 at which the formation of the ANPC was first mooted. Perhaps more importantly, it was an opportunity to discuss goals and directions for the Network's future.

The 1993 conference was held in Hobart as part of the celebrations marking the 175th anniversary of the Royal Tasmanian Botanic Gardens. This connection ensured a strong Tasmanian theme to conference proceedings. Highlights included Professor Jamie Kirkpatrick's keynote address outlining plant conservation issues in Tasmania, a tour of the Royal Tasmanian Botanic Gardens hosted by the Friends of the RTBG, the excellent conference dinner of Tasmanian seafood at Mures Restaurant and the field excursions on the final day to Port Arthur, Freycinet National Park and Mt Field National Park.

The conference consisted of three days of sessions followed by a day of field trips. Sessions were organized in half-day blocks ad-

ressing particular themes. Apart from the first morning, which consisted of six papers developing the conference theme, each session included several short introductory papers followed by a workshop in which issues raised in the papers were discussed at length. For the workshops, the conference broke into small groups (of up to about 15 delegates), in which discussion, facilitated by a group leader, was focussed on a set of questions provided in the conference papers. At the end of each workshop, the conference re-convened for a short report-back session. Workshop themes included: databasing, genebanking, species recovery, re-introduction, future directions and the broader view of plant conservation in Australia. At the end of day three, all of the workshop discussions were brought together in a plenary session in which resolutions formulated by the workshop leaders were put to the meeting, discussed, modified where necessary and carried. The conference resolutions represent the message that the delegates wish to deliver to the wider community, and are presented elsewhere in this issue of 'Danthonia' (see page 6.)

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EDITORIAL

We have some fairly meaty reading in this issue of *Danthonia* and frankly not many pretty pictures. *Danthonia* received some complementary and encouraging mentions at the Hobart Conference. Several delegates spoke of the usefulness of a publication that can provide a forum for professional scientists and 'enthusiastic amateurs'. Dr Kingsley Dixon of Kings Park and Botanic Garden in Perth said that it was an ideal medium for what he called 'vernacular science'; the type of science that does not get into the major refereed journals; the type of science that can not wait ten years before the results are in. We want to hear about the small scale trials that you do, including the unsuccessful ones. We have to learn about the failures so that we don't make the same mistakes again (and if you insist we'll publish your article anonymously!).

Please send information or articles for *Danthonia* to the address on this page. It would be appreciated if the longer articles could be sent to us on a 3½" floppy disk. We can cope with most common word processing programs, but if in doubt give us a call.

We also want to publish drawings or photographs to illustrate your articles. As we can only print in black and white, (or green and white, really), please select illustrations that will reproduce in monotone.

Let's hear from you. Your fellow Network members want to know what you are doing—that's what this Network is all about.

The ANPC people have settled into a different part of the Australian National Botanic Gardens. Would you please note that our new number for general ANPC business and for *Danthonia* is 06-2509509. Our facsimile number is 06-2509528. The old numbers will still find us but these are more convenient.

Welcome to Jeanette Mill who has joined us in the ANPC office on contract to help with extension work and data collection and Jeanne Trebeck who is working with us as a volunteer to help with administrative tasks.

Don't forget to renew your subscription. We rely on your support to keep ANPC's activities going.

A new book was released at the ANPC conference in Hobart. *Management of Endangered Plants*, by Simon Hopper, published by CSIRO Publications, 182 pp, \$49.95 aims to bring together information from hundreds of books, journals and databases to provide the best and most up-to-date account of the management of rare or threatened plants.

We hope to publish a detailed review of this book in the next issue of *Danthonia*.

Danthonia

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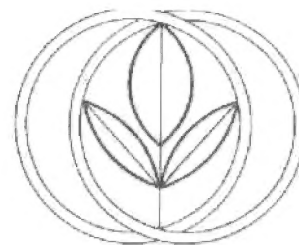
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If attendance of delegates and participation in discussions indicate an organization's strength and energy, then the ANPC is vital and healthy. Despite some of the best weather that Hobart has ever produced, all sessions were crowded and discussion lively. Small groups continued the discussions at every opportunity outside the sessions. More than 100 delegates from all states and territories in Australia and a few from overseas attended the meeting. A wide range of organizations interested in plant conservation was represented. Many of those who attended came as interested individuals and many non-ANPC members were present. This attendance ensured that a broad range of views was expressed during discussion. A full list of delegates will be available from the ANPC co-ordinating office in due course.

The conference title: *Cultivating Conservation*, describes the aims of the meeting on two levels. On one level, the conference program reaffirmed the ANPC's emphasis on plant conservation through cultivation. At a broader level, the title also indicates an educative approach to plant conservation - through raising awareness of the plight of rare or threatened species, habitat loss and threatening processes, and encouraging conservation activities by its members and the wider community. Both approaches were addressed in the conference program and were supported by the delegates.

Throughout the conference a strong emphasis was placed by organizers and speakers on applying an 'integrated' ap-

proach to plant conservation. This is a theme which was expounded strongly at the 1991 meeting by Don Falk of the Center for Plant Conservation, USA, who has written extensively on networking and integrated conservation. Essentially, what is proposed is that conservation work should entail in-situ and ex-situ activities, should involve people from all parts of the community, and that conservation includes much more than just saving endangered species. This concept has been adopted by ANPC as its fundamental approach to plant conservation in Australia. Readers are encouraged to explore the literature on integrated conservation, perhaps starting with Don Falk's paper in the proceedings of the 'Protective Custody?' conference of 1991 (Falk, Donald A. 'Steps to the Formation of a National Plant Conservation Network' in Butler et al, *Conservation of Rare or Threatened Plants in Australasia*, Australian National Parks and Wildlife Service, Canberra, 1992).

A wide range of issues relevant to the network was addressed in the three days of papers and workshops at the meeting. These issues were addressed mainly from the point of view that the network's emphasis is on preventing the extinction of endangered species primarily by ex-situ means such as cultivation and reintroduction. The issues can be summarized as relating to four fundamental questions:

- what is the ANPC and who are its members?;
- what is the role of the network in plant conservation?;

- what measures can be used to fulfil this role? and;
- what resources are needed to do the job and how can these be developed?

Much of the conference's time was spent addressing the last three of these questions. Conference outcomes will be described by examining these questions in turn.

The identity of the ANPC and its membership, and its history to date were set out by Mark Richardson on the first morning, providing a context in which to consider the broader questions of directions and issues.

The role - both current and potential - of the ANPC, was addressed by speakers in a number of sessions and was also a frequent topic of conversation away from the formal sessions. There was a strong sense that the emphasis to date on conservation of endangered species through cultivation in botanic gardens needs to be broadened and extended. In conjunction with extending the network's role, there was a strong call from the meeting to extend the size and breadth of membership. In particular, it was felt that more attention should be paid to the place of private industry, local community groups and a broader range of local and state government departments in the network.

Four main areas of activity were identified as comprising the Network's primary mandate. These include: databasing and information exchange; developing priorities and protocols for conservation work; liaison with government organizations (especially the Endangered Species Unit) and; education, interpretation

and extension of plant conservation into the community. A further important area of activity is in fund-raising, about which there was considerable debate. In the end, it was accepted that the ANPC does have a fund-raising role, but that its primary function in this area is to inform its members of funding prospects and to lobby governments for support of network activities.

The meeting identified measures that the ANPC can adopt to fulfil its mandate in each of the four areas of activity. The ANPC's newsletter, *Danthonia*, and a central database to be developed and operated from the ANBG, were seen as the primary tools of information exchange and databasing. Despite variation in opinion in relation to the details of database operation, it was agreed that a centralised database and information exchange would greatly benefit members, especially smaller groups who did not have access to large libraries or scientific expertise. The conference resolved to set up an ANPC working group to develop protocols and address the issues involved in database/information exchange set-up.

Much discussion focussed on the limited amount of funding available for endangered species work, and how what little there was could be better spent. It was concluded that limited funds could be more efficiently used by avoiding duplication of effort and more carefully directing work to higher priority taxa and projects. Better use of resources could also be made by ensuring that ex-situ conservation efforts were as efficient

and effective as possible. This applies particularly to genebanks which, it was recognised, have the capacity to conserve large amounts of the genetic resources of Australia's flora for relatively little outlay. The meeting resolved to establish a working group to develop collection priorities and a range of guidelines and protocols covering all aspects of ex-situ conservation.

One full day of the meeting was spent in considering the issues of species recovery and reintroduction. Although the ANPC does not itself carry out activities in these areas, they lie at the heart of much of the work undertaken by ANPC members. The ANPC can play an important role by providing up-to-date information on techniques, available expertise, protocols, local contacts and so forth. The conference provided an appropriate forum for discussion of many of the issues important to successful species recovery and reintroduction. In particular, the illustrated case studies of projects presented by several of the speakers in this session served to draw out the major issues involved. Some of these issues include the role of different groups, problems of taxonomy and propagation, commercialisation as an aid to recovering species and ethical issues surrounding reintroduction.

The role of the Network in education and extension was considered in a similar way, with speakers presenting case studies of successful projects from which general principles could be drawn. The meeting strongly endorsed the education/extension role of the ANPC, perceiving this to be an

area where much progress could be made. In pursuing this role, it is expected that the network will develop materials to be used in schools and by community groups and will publicise project work undertaken by members.

The meeting recognised that it is one thing to say that the network should do all these things, but another to provide sufficient resources for it to do so. Again, funding limitations are the most serious issues facing the ANPC. To date the co-ordinating office has been supported by the Australian Nature Conservation Agency (ANCA) through the Australian National Botanic Gardens (ANBG), and it seems that, for the immediate future that arrangement will continue. It was clear from discussions on this issue that most delegates believed that it is appropriate that ANCA continues to support the work of the Network. This was supported for two main reasons; firstly because the Commonwealth Government has accepted a responsibility to conserve Australia's native flora and fauna by signing the Rio Convention, by developing its National Strategy for the Conservation of Biodiversity and by legislation through its Endangered Species Protection Act (1992). Secondly, it was argued strongly that support for the network is likely to produce cost-effective plant conservation on a species-by-species basis.

The conference recognised that Commonwealth funding was unlikely to be sufficient for the tasks at hand, nor reliable enough into the future, and resolutions were passed to actively seek short- and long-

term funding support for the Network's activities from other sources, particularly private industry.

Apart from the issue of funding, which is likely to be a perennial problem, the meeting recognised information and membership as primary resources to be employed in achieving the goals it has set for itself. The meeting's resolutions call for a membership drive to improve the income and resource base available for its work.

In summary, the 1993 conference has resulted in a clear agenda for the next few years' activities for the Network. Several problems have been identified, and efforts have been made to address them. The workload of the co-ordinating office is likely to increase as a result of the conference, and additional resources will be required if all that was set out is to be achieved.

The conference congratulated those involved on what has been achieved to date in the short life of the ANPC, and praised the sterling work of the conference organisers in staging what was judged a highly successful meeting.

Jock Morse works for the Australian Tree Seed Centre, Canberra.

The Conference Proceedings will be published in a few months and will be announced in Danthonia. Copies of the Conference abstracts are available to readers who were unable to attend the Conference from the ANPC Office.

LETTERS

from Egon Demuth

A reflection on the recent most damaging fires in NSW and our Hobart Conference.

Our inaugural ANPC conference in Canberra had put a lot of emphasis on ex situ conservation, against an emphasis on in situ conservation at the recent Hobart conference. I felt some disquiet about this direction, pointing out that in situ areas may no longer be viable or available.

The recent catastrophic fires in the Royal National Park, Sydney, should by now have spelt out a very clear and readable message. This in view of areas being burned a second year in a row, giving some species no chance at seed regeneration.

The number of people caught deliberately lighting fires was also unprecedented; as I have previously pointed out, fire warnings serve to encourage every loony to race out looking for matches and for somewhere to apply them.

To me one thing seems clear, and it should be part of all future ANPC policy:

No in situ area should be regarded as safe. Threatened plants should receive as much back up and as wide a distribution as possible to supplement in situ conservation.

In situ conservation should be co-ordinated with ex situ at all times. This is written in the light of devastating fires, coupled with population increases and urban spread, greater mobility of population and all sorts of associated

threats therefrom which are likely to increase rather than decrease, without needing recourse to a crystal ball.

I would like to see this message go to the ANPC Advisory Committee and to any future meeting.

Egon Demuth, Kingfern Native Nursery, PO Box 110, Albion Park, NSW 2527

from Joe Thompson

Following the Hobart conference in December 1993, I have given much thought to the establishment of regionally-based centres for promoting the aims of the ANPC (see resolution 2).

I believe that such centres, rather than being formally structured organisations, should be composed of a loose affiliation of people and bodies with an interest in plant conservation within the region. They would, however, work under the umbrella of the ANPC and within its guidelines. These informally organised groups could provide the greatest flexibility and long-term benefit for both the people and the plants involved.

Anyone with an interest in establishing a centre in the Central Western area of NSW is invited to contact me at home or at the Burrendong Arboretum.

Joe Thompson, Curator, Burrendong Arboretum, PO Box 465, Wellington, NSW 2820, phone (business hours) 068-467454, (after hours) 068-453602

Note: We would like to hear from members in other regions who are interested in the formation of a 'local group'.

RESOLUTIONS OF THE 'CULTIVATING CONSERVATION' CONFERENCE

From the conference workshops, a number of preliminary resolutions were presented to the delegates and were accepted in principle. Using these and further points drawn from the plenary session the conference resolutions were compiled.

The Delegates of the Conference recognise:

1. the valuable contribution of the Australian Network for Plant Conservation (ANPC) to integrated plant conservation in Australasia, and endorse the ANPC's primary role of networking and the collation and dissemination of information.
2. and commend the ongoing strong support that has already been given by the Australian Nature Conservation Agency (ANCA) for ANPC work.
3. the need for ANPC to continue to operate an office in Canberra, responsible for national co-ordination.
4. and commend the work that has been done by the national office since the establishment of the ANPC and the work of the organisers of the first national ANPC conference.

Further, the delegates resolved that the ANPC should:

1. raise its profile and expand its membership.
2. encourage its members to establish local, regional, state and territory networking mechanisms and structures.
3. seek increased Endangered Species Program funding for projects identified as essential to the further conservation of Australia's endangered flora, including adequate funding for surveys to resolve the conservation status of poorly known taxa.
4. improve local integrated conservation efforts, and strongly encourage members to pursue other sources of project funding in addition to that provided by ANCA.
5. continue the development of a directory database to facilitate access to information relevant to plant conservation, including that held by ANPC members.
6. create a national threatened plant species database working group with balanced representation from plant conservation groups to establish standards for monitoring, record-keeping and databasing for plant conservation.
7. facilitate the development of a list of plant taxa and communities requiring high priority conservation action.
8. solicit, collate and disseminate information on reintroduction projects.
9. ensure that long-term germplasm storage is developed as a strategy for threatened species conservation in Australia.
10. create a working group of suitably qualified ANPC members to prepare the terms of reference for the production of a protocols document for the collection, storage, viability testing and dissemination of germplasm through a national germplasm bank and seek funding for the production of the protocols document.
11. create a re-introduction working group within ANPC to produce draft national guidelines by reviewing and if necessary modifying existing guidelines and minimum standards. These draft guidelines should be reviewed by relevant stakeholders in plant conservation and be endorsed by the Australian and New Zealand Environment and Conservation Council (ANZECC).
12. promote and facilitate adequate training for participants in recovery programs.
13. develop an accreditation scheme for private growers and nursery operators and recommend that Australian botanic gardens and ANPC members make use of those nurseries.

PIONEERS OF BURRENDONG

A Tribute to George W Althofer, OAM, written by Jack Harris, long time friend and Colleague.

With the death of George Althofer on the 8th of March 1993 the Burrendong Arboretum lost not only its founder but also a man who contributed an immense amount of knowledge and energy to its maintenance. George was a person who, in the early 30s, appreciated the danger to the Australian flora from the increasing clearing of bushland for agricultural, pastoral, mining and other purposes.

As a nurseryman handling Australian plants George collected seeds and specimens for his business from many parts of the Australian bush. He acquired a great knowledge of our native plants, their habits, growth requirements and distribution in the course of his work. George, a self trained botanist, was once asked how many plants he would be confident of knowing. He thought for a moment and replied that he "supposed about 2000".

With his vision of providing a sanctuary for threatened species of native plants he set about selecting an area of land suitable for that purpose. After many submissions to the Soil Conservation Service and the governments of the day, an area of 164 ha. was set aside for an arboretum on the foreshores of Lake Burrendong.

Instrumental in establishing not only the Arboretum but also the Burrendong Ar-

boretum Association, George supervised the development of the Arboretum in his role of Chief Botanist/Honorary Director until his retirement in 1979. From computer records, over 2000 accessions of plant material are credited to his name along with many hundreds of others in conjunction with other people.

George was the author of many books, encompassing local history, a comprehensive local flora (with Gwen Harden), and several volumes of poetry. The book he strived for, "the dream of half a lifetime", *Cradle of Incense* was published in 1976 and was a comprehensive look at his beloved mintbushes.

Awarded the Order of Australia in 1979, George remained a humble man.

John A Harris, better known as Jack, passed away on 25 October 1993. The following piece was written by his son Hal, a trustee of Burrendong Arboretum.

From its foundation Burrendong Arboretum played a large part in my father's life. Jill and Norman Griffiths recruited my father to help George Althofer turn his dream of protecting Australia's plants into reality after the land was made available in 1964.

Jack Harris' scientific training as a B AgSc at Sydney University and employment with the CSIRO made him very aware of the need for accuracy in record keeping. In the early days of the Arboretum he was involved with the mapping of the area and the marking of contours.

For many years he kept track of the accession slips and entered all of the planting details on a card system. This was very time consuming, and in the 1980s, Jack moved into the computer age. He was in his 70s at this time, but he took to computers like a duck to water.

During this period he was Chairperson of the Burrendong Arboretum Association, editor of its newsletter, *Brigge*, and after the retirement of George Althofer he was appointed Honorary Director of the Arboretum. He was a prolific letter writer to politicians and bureaucrats and provided 100% support to the Althofers in defending and improving the Arboretum.

My father achieved two of his three goals for the Arboretum. In 1990 an independent trust for the management of the Arboretum was formed, of which he became a member. In 1993 he completed the checking and entry of all accession and planting records on to the computer database. Thanks to his dogged determination and long hours of work, the Arboretum records are now a readily accessible scientific resource. His third objective - to make the Arboretum more financially secure - has yet to be achieved. That is the challenge. I am sure that we will all work towards that goal inspired by the example set by Jack Harris and his two colleagues, George and Peter Althofer.

George Althofer's brother Peter, for many years Curator of Burrendong Arboretum, died in 1991.

BUSHFIRE CONCERNS

by Geoff Butler, ANBG

One of the factors considered in the establishment of the ANPC was the potential of collections to address catastrophes that may affect populations of endangered plant species. We have recently experienced such an event in NSW with bushfires that ravaged large areas of the state and which are known to have affected a number of endangered or threatened plant communities.

The emphasis during the extraordinary events of early January 1994 was obviously on saving human lives and property. Early predictions by the Fire Control authorities indicated that if only 2000-3000 houses were lost, we could consider ourselves lucky. Fortunately the losses were much lighter due to the valiant efforts and superb co-ordination of the firefighters and their commanders. The effects of the fires on wildlife and ecosystems will only start to become obvious as time goes by. There are, however, a number of obvious issues that arise as a result of the fires.

There are unfortunately a number of opportunistic and self interested persons and organisations that have already mobilised themselves to take advantage of the emotional after effects of the fires. They are using the fires to attack the management practices of, in particular, the NSW National Parks & Wildlife

Service. This is despite the facts that have been presented on how, when, and where the fires actually started. These attacks are founded not on environmental grounds, but on the interests of the people and groups in obtaining access to more of our natural areas for the purposes of agriculture, grazing and activities of a questionable nature. We must be prepared to counter these antagonists in the strongest way, using reason and fact as the main weapons in our armoury, and be especially prepared to enter into the discussions that will ensue on hazard reduction burning.

The degree of damage to ecosystems may be permanent in some cases. Many patches of urban bushland have been completely destroyed. While some species will regenerate, the potential for weed invasion from surrounding suburban areas is very high. Also, many good examples of urban bushland e.g. Lane Cove National Park, have now been completely cut off from other natural areas, and colonisation of these areas by wildlife and plants may be limited if not impossible. This now raises the issue of restocking and/or reintroductions.

Australia is fortunate in having the best community involvement in environmental revegetation and rejuvenation in the world. Many of these groups may require our encouragement and motivation to get back on the job. They may be able to assist not only in limiting the spread of weeds in the regenerating areas, but to help record the succession of vegetation on their reserves, and would be able to indicate which species, if

any, are not returning satisfactorily.

One area that does need to be addressed is town planning. While many Councils are aware of the consequences of bushfire and plan accordingly, many others in the rush for extra rates have allowed development on sites that will always be threatened by wildfire. Many of these Councils breach the recommended development guidelines of the bushfire authorities. This is an issue of major concern to the ANPC.

Last but certainly not least, what has happened to the endangered and threatened species of the district? Will reintroductions from the documented clones of the National Endangered Species Collection be required? While hoping not, we must be prepared to assist if called on.

It behoves all ANPC members to assist in whatever way they can during the post mortem on the fires.

Changes at CPC

The Board of the Center for Plant Conservation (USA) has appointed Dr Brien Meilleur as President and Executive Director. Brien was previously Director of the Amy Greenwell Ethnobotanical Garden in Hawai'i, a part of the Bishop Museum, Hawai'i's State Museum.

Dr Meilleur replaces Don Falk as Executive Director of the Center. Don has left to pursue graduate studies in ecological restoration.

MEMBERS ACTIVITIES

Eurobodalla Native Botanic Gardens

One of the casualties of the January bushfires in New South Wales was the Eurobodalla Native Botanic Gardens at Batemans Bay. The Eurobodalla garden, a member of ANPC since its inception, was totally destroyed when a fire jumped a road, destroying just about everything that was burnable, including the small nursery/shadehouse and the home of the Gardens' superintendent, John Knight and his family, who were given 20 minutes to evacuate the house. Most of the Knight family's possessions were destroyed in the fire.

The work of the Gardens to date has been greatly assisted by an enthusiastic Friends Association and the Association has launched a fund to assist in the recovery of the Garden. Readers of *Danthonia* who would like to assist the Eurobodalla Native Botanic Garden to rise from the ashes are invited to make a contribution to The Gardens Rehabilitation Fund, c/o Friends of Eurobodalla Native Botanic Gardens, PO Box 1068, Batemans Bay, NSW 2536. Further information may be obtained from the President of the Friends, Mrs Pat Spiers, telephone 0424-724180

We were sorry to learn of the death recently of Dr Murray Wallace, a founding member of the Friends of Eurobodalla Botanic Gardens and Chairman of the Gardens' Management Committee.

COMMUNITY MONITORING PROJECT ANNOUNCED BY GREENING AUSTRALIA

In January 1994 bushfires in New South Wales burnt hundreds of thousands of hectares, as well as claiming lives and property. The Ash Wednesday fires in Victoria and South Australia burnt 350 000 hectares, destroyed much property and claimed many lives.

We sympathise with those suffering loss and applaud the efforts of the thousands of fire-fighters who fought the fires. We watched graphic television coverage and heard the media reports that tens of thousands of hectares of bush had been "devastated" or "destroyed". But has that really happened?

Fire has been an integral part of the Australian environment for a very long time and much of our native vegetation is superbly adapted to living with fire. Most of the burnt areas are likely to regenerate over time. Modern Australians need to develop an understanding of the relationship between bush and fire and human activity, so that appropriate planning and management responses can be made.

To assist in the development of this understanding, Greening Australia is developing a community monitoring project to assess how vegetation regenerates after fire. This knowledge can ultimately help all Australians to better manage their land for fire safety while preserving the ecological values of urban and rural bushland.

The monitoring program has been designed to cater for varying levels of skill and knowledge, so that anyone that is interested can make a real contribution to collecting data. It involves selecting a few square metres of burnt bushland (not in a national park) and recording what happens over a ten week period.

If you or your community group would like to join this project please, in the first instance, contact the Greening Australia office in either Sydney or Canberra.

Addresses are; GPO Box 9868, Sydney, 2000 (phone 02-5500720), contact Michael Adams, or PO Box E216, Queen Victoria Terrace, Canberra, ACT, 2601 (phone 06-2823214), contact Val Wiseman.

This program has been developed in consultation with the CSIRO Bushfire Ecology Unit and the National Office of the ANPC.

Changes at BGCI

The Chairman and Board of Trustees of Botanic Gardens Conservation International (BGCI) have announced the appointment of Dr Peter Wyse Jackson as secretary General of the organization. Dr Wyse Jackson succeeds Professor Vernon Heywood who has been Director since BGCI was established in 1987. The appointment took effect on 1 January 1994.

SPECIES PROFILE

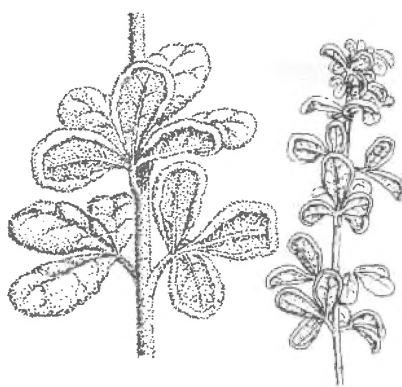
ZIERIA BAEUERLENII

J A Armstrong ms

Prior to 1987, an undescribed species of *Zieria*, known from herbarium specimens as *Zieria* sp 'M' and believed at one time to be a form of the more widespread *Z. cytisoides*, was believed to be extinct. It was originally recorded in 1883 from a population on the "lower Shoalhaven". A search in 1976 using locality information from a later collection made in 1943 failed to locate the species. However a further search in 1987 relocated the species near Nowra, New South Wales, within view of a suburban development and only a short distance from a major water pipeline.

In an article published in *Australian Natural History* Mark Richardson of the Australian National Botanic Gardens wrote; "Although not an outstanding plant in any aesthetic sense, biologically the population is very interesting. When discovered, cuttings were taken from 5 of the 120 plants at the site. Tests carried out at the Australian National Botanic Gardens showed little if any genetic variation between the plants sampled. Further samples were collected from plants up to 50 metres apart and still no variation was detected. The possibility that the population has developed from vegetative or asexual reproduction is strengthened by the finding that pollen collected from the flowers within the population is 95% sterile. The lack of genetic diversity not only makes this

population more vulnerable to disturbance, but also means that factors other than its morphological characteristics will have to be taken into account when considering its status as a species. ...this species of *Zieria* is still considered to be endangered and the site of the population has been nominated for protection through the Register of the National Estate."



Zieria sp 'M' from 'Flora of New South Wales'

The re-discovered *Zieria* was taken into cultivation at the Australian National Botanic Gardens as part of the Gardens' endangered species collection and to provide plant material for research, and education and, by so doing, lessen the likelihood of over collection of the wild population.

As so often happens, once re-located the *Zieria* was found to be subject to new threats. For some years the site of the endangered *Zieria* had been under consideration by the local council for a relief road and bridge (over Bomaderry Creek). In 1990 the Shoalhaven Branch of the Australian Conservation Foundation wrote to the NSW Minister for the Environment expressing concern about Coun-

cil's plans and about vandalism on the site. The ACF requested that consideration be given to the application of an Interim Conservation Order. Considerable discussion took place in the local community and a number of quite outrageous statements were made about the possibility of the plant becoming a 'noxious weed' and that perhaps the plants had been 'planted' by malicious persons who wished to stop development.

Subsequent actions led Council, the National Parks and Wildlife Service of NSW and a Nowra citizen to the NSW Land and Environment Court.

In August 1991 Council made a development application to itself, as consent authority, to permit the construction of a road and bridge over Bomaderry Creek linking

North Nowra to the Princes Highway. The application was accompanied by a 2-volume Review of Environmental Factors and Council subsequently approved its own application for the construction work subject to the imposition of appropriate conditions of consent. A license was applied for under section 120 of the NSW National Parks and Wildlife Act "to take or kill endangered fauna".

It was noted later by Judge Stein that "it is somewhat strange that under State law rare and endangered plants are not accorded similar protection to rare and endangered fauna, especially since flora is important for biological diversity and advances in medical science sometimes involve the

application of rare plants".

The National Parks and Wildlife Service considered Council's application, together with a number of public submissions but eventually a license was granted. It should be emphasised that the subsequent court hearing was centred on the presence of endangered *fauna* on the site and that whilst the endangered plant species were referred to by the Judge, it was fauna that was the basis for the appeal against the granting of a license being upheld, and the license refused.

So for the time being the site of *Zieria baeuerlenii* seems to be safe, at least from roadworks. The Shoalhaven Branch of ACF have continued to fight to protect the bushland and is at present attempting to raise public support to have the area declared a reserve.

The court case and Judge Stein's decision are of great significance to endangered species conservation and we will publish a more detailed article on the case in the next issue of *Danthonia*, together with an overview of threatened species legislation in Australia.

References

Richardson, M, "Rare & Endangered-'Extinct' Plants Discovered" in *Australian Natural History*, vol. 22, no. 11, Summer 1988.

Stein, J, Judgement in the matter of Leatch v Director General National Parks and Wildlife Service and Shoalhaven City Council, 23 November 1993, Land and Environment Court of New South Wales.

Endangered Dryandras

By Tony Cavanagh, Newsletter Editor, SGAP Dryandra Study Group.

With the August 1993 issue of *Danthonia* we also received the ANZECC booklet, *Threatened Australian Flora*, dated June 1993. While I welcome this latest listing, it is of concern to me that the listing for rare or threatened *Dryandra* is, in my opinion, very inadequate. In the above, three species are listed as endangered; *D. mimica*, *D. sp. Kamballup* and *D. sp. Stirling Range* (F Lullfitz 3379), while *D. serratuloides* is shown as vulnerable.

In our Newsletter No. 22*, Margaret Pieroni discussed the status of rare and threatened *Dryandra*. Margaret has an extensive knowledge of the status of dryandras in the wild and has seen all the species in their natural habitat. There are quite a number of un-named species which are known from only single or small populations or are found in threatened areas. I have listed these below and can provide further information if required.

However, my concern is that while the plight of these species has been brought to the attention of relevant authorities on several occasions, nothing appears to have been done to include them on the ANZECC list. Can I again ask that these species be surveyed and their status be recorded? I would be delighted to be proved wrong if even some of the species are found to be less endangered than we believe but until they are properly surveyed, we will not know.

Species which I understand to be in danger include:

Dryandra sp. aff. plumosa (MP 26). Occurs in only one location in the Stirling Ranges, the disused part of a gravel pit. The pit is still in use and the access track crosses the plant's habitat. The area is also recommended as a tourist stop!

Dryandra sp. aff. falcata (ASG 16886). A tall, very prickly species with flowers like *D. falcata*. Only a small number of plants occur in the Stirlings near a small gravel pit in an area severely affected by *Phytophthora cinnamomi*. Only six plants were found in a recent survey.

Dryandra sp. aff. ferruginea (KT Alcock 426). Again found only in the Stirlings where a popular walking track crosses its habitat.

Dryandra sp. aff. armata (Ted Griffin sp. H) from near Kalbarri and *Dryandra sp. aff. armata* (K Newby 2226) from near Three Springs are both found only in small populations.

Dryandra sp. aff. fraseri (ASG 16788), 'tree fraseri'. An unusual tall form of *D. fraseri* from a limited area near Three Springs.

Dryandra sp. aff. conferta (ASG 16754), grey-leaved *conferta*. This is a highly attractive plant from a single roadside population near Corrigin, containing as few as 60 plants.

Dryandra sp. aff. ferruginea (ASG 16740), Kulin dryandra. This plant has spectacular large papery inflorescences and makes a very attractive garden specimen. There are three, small disjunct populations containing around 100 plants. It grows near Kulin.

Dryandra sp. aff. calophylla/pteridifolia (ASG 16879). From a limited area near

Woodanilling where it grows in a disused gravel pit and partly in a flora reserve. Again, there are around 100 plants.

There are three other species that might prove to be endangered - two forms of *D. hewardiana*, ASG 16789 from near Three Springs and ASG 16647 from near Woodanilling as well as a form of *D. sclerophylla* from Badgingarra.

All of the above deserve consideration for inclusion in the listing of endangered species. A number are already in cultivation in the eastern states, especially in Victoria, and have proved hardy. There may be scope to re-introduce plants to the wild from these cultivated specimens in future years

*SGAP Dryandra Study Group Newsletter, No 22, July 1992.

Editor's note:

Tony Cavanagh's letter was brought to the attention of Dr Ken Atkins of the WA Department of Conservation and Land Management (CALM), the WA representative on the ANZECC Endangered Flora Network. We understand that CALM has replied to Mr Cavanagh. We also understand that most of the taxa referred to above are listed as 'poorly known' by CALM. Subject to further surveys the taxa may be subsequently listed as rare, vulnerable or endangered. (It should be noted that the ANZECC list referred to by Tony includes only those taxa that are regarded by the Endangered Flora Network as extinct, endangered or vulnerable). Study Groups, or individuals, who

have information on threatened species are advised to contact the representative of the Endangered Flora Network for their state or territory, or the Network's secretary, c/o the Endangered Species Unit, Australian Nature Conservation Agency, PO Box 636, Canberra, ACT 2601

DIARY

"Growing Together Towards 2000"; the fourth annual conference of the Association of Friends of Botanic Gardens (Victoria) Inc. will be held on the 14th and 15th of May, 1994, at the Institute of Educational Administration, Eastern Park, Geelong. The conference will focus on the role; promotion, funding and future direction of friends groups and botanic gardens. ANPC members, such as the Botanic Gardens of Adelaide and the Royal Botanic Gardens, Melbourne, are among the keynote speakers and another ANPC member, Alcoa, is a co-sponsor of the conference. For further information, please contact:

Jayne Salmon, President, Friends of Geelong Botanic Gardens, (052) 435094

Ian Rogers, Director, Geelong Botanic Gardens, (052) 261267

An international conference on the Role of Networks in Nature Conservation will be held in Geraldton, Western Australia from 15-20 May, 1994. The conference will cover such subjects as: why we need community involvement in conservation; the role of indigenous people in conservation; the link between scientists and com-

munity groups involved in conservation; conservation biology as a discipline and as a force for change; current understanding of landscape linkages in conservation; the role of landcare groups in conservation; integration of conservation, production and development; and the role of mining companies in conservation. These issues, together with other subjects related to the conference theme will be presented in invited papers as well as structured workshops. The ANPC believes that it has much to contribute at a forum such as this and Mark Richardson of the ANPC co-ordinating office will be presenting a paper titled "An integrated approach to plant conservation in Australia". The paper will discuss not only the ANPC but also the problems associated with networking.

Further information from Dr Dennis Saunders, CSIRO Division of Wildlife and Ecology, LMB No 4, PO Midland, WA 6056, phone (09) 252 0111, fax (09) 252 0134

"A Vision for A Greener City" is the title of Greening Australia's 1994 national conference, to be held from 4th to 6th October 1994 in Fremantle, Western Australia. The conference will address the role of vegetation in urban environments. Vegetation plays an important role in urban areas; whether metropolitan or rural, large city or small town. It influences our emotional well being, providing local character to a place and a sense of the change of seasons, defining space and providing privacy as well as contributing to water quality and drainage, oxygen

supply, temperature control, noise abatement, provision of habitat and heritage of species. The 1994 National Greening Australia Conference aims to increase awareness of the significance of vegetation in creating more livable urban areas and to improve planning and management practices related to vegetation in urban and surrounding environments.

Further information from Motive Conventions, GPO Box M973, Perth, WA 6001, phone (09) 322 2666, fax (09) 322 1417

BOOK REVIEW

by Isobel Crawford, Botanist,
Canberra

Threatened Flora in Australia: a Select Bibliography.

By Kevin Slattery and Robert L Wallis. Deakin University, Rusden Campus, and Australian Nature Conservation Agency, Canberra. 1993, 132p.

This printed bibliography is the third in a series on rare or threatened species in Australia, and contains 1800 references to 700 plant taxa. The first, published as a printed volume in 1991, contains more than 3 000 references to 580 animal and 180 plant taxa. Volume 2 was produced in 1993. It contains 2 000 supplementary references to nearly 800 species, with a greater emphasis on plants than volume 1. The database for the bibliography, now referred to as the Threatened Species Database, has been split into its flora and fauna components for ease of reference. Volume 4, listing new references to fauna, is

planned for publication in 1994. The project has been funded by the Endangered Species Program of the Australian Nature Conservation Agency since 1991.

The first three volumes may also be accessed as a single database via the Heritage and Environment CD-ROM, produced by Informit at RMIT, and available at many academic and public libraries.

Although this publication is not an annotated bibliography, helpful annotations have been made to some references, e.g. a paper simply entitled 'Rare or endangered species of plants' is annotated [*in NSW*] [*includes 12 Acacia, 1 Actinotus...*].

References are indexed under the scientific name of each taxon (family, genus, species), under Plants (General) and occasionally under terms such as Rainforest Conservation (check v.1-2). 'See references' are usually given from the English common name to the scientific name.

The initial Plants (General) section of the bibliography provides an excellent introduction to the literature of rare or threatened Australian plants. There appears to be a good coverage of the 'grey' literature not included in standard abstracting and indexing services, i.e. unpublished and draft documents and theses picked up from library accession lists of pertinent state departments.

Selection criteria have been tightened since the work was initiated. It now includes only taxa listed in Briggs & Leigh (1988) and ANZECC EFN (1993). Earlier volumes also include taxa treated in publications such as Pryor (1981),

e.g. *Eucalyptus remota* which is not rare or threatened in the Briggs & Leigh (1988) sense. The inclusion in volume 3 of two references to *E. regnans*, another non-ROTAP taxon, reflects the earlier, wider coverage of more general conservation articles, now excluded.

This bibliography is highly recommended for private, public and academic libraries. Copies are available from Mr C Lewis, Librarian, School of Aquatic Sciences and Natural Resource Management, Rusden Campus, Deakin University, Blackburn Road, Clayton, Vic., 3168 for \$25 (including postage and handling), (v.1. \$23; v.2 \$19)

The entire database is also available as a ASCII format floppy disc for \$50 from the above source, or as one of a series of 12 databases on the Heritage and Environment CD-ROM for \$287 from Informit at RMIT in Melbourne.

References

Australian and New Zealand Environment and Conservation Council (ANZECC). Endangered Flora Network. (1993) *Threatened Australian Flora*. Australian Nature Conservation Agency, Canberra.

Briggs, J. D. & Leigh, J. H. (1988) *Rare or Threatened Australian Plants*. Rev. ed. Special Publication 14, Australian National Parks & Wildlife Service, Canberra.

Pryor, L. D. (1981) *Australian Endangered Species: Eucalypts*. Special Publication no. 5, Australian National Parks & Wildlife Service, Canberra.

LETTER

ANPC'S DATABASE NEEDS

Jim Croft, Centre for Plant Biodiversity Research, Canberra

Following discussions with some participants in the recent 'Cultivating Conservation' conference it became clear that there has been some misunderstanding and lack of comprehension of the information design activities undertaken for the ANPC over the last year. It is quite clear that delegates at the conference picked up the wrong message and it is important that their concerns be addressed.

At the 1991 conference in Canberra, delegates requested that some information design work be started to define the type of information that ANPC contributors and users would be interested in, with a view to using this design as a guide for the future development of ANPC datasets to ensure uniform practices of recording data. This is especially important for those organizations and individuals starting out in the data capture and data processing field. The idea was to take into account, as far as possible existing data exchange standards and existing data storage conventions of ANPC stakeholders.

Using hardware, software and office facilities provided by the Australian National Botanic Gardens, a consultant, Dr Joe Swartz, was employed on contract to produce an information model covering the entire ANPC enterprise from which databases or parts of databases could be built to sat-

isfy the needs of the ANPC national office and members. To adequately describe all the information needs of the ANPC proved to be a very complex, but very valuable exercise. Ideas were incorporated from existing national and international biological standards and current practice in Australian botanic gardens and conservation agencies.

The information model, part of which was presented at the 1993 conference in the form of descriptions of selected database tables and some sample data entry forms, appears sound and could be built on any contemporary database system and hardware platform, including cards or paper. I urge participants to study it carefully or pass it to their systems people for comment as to what type of critical information must be accommodated and feed back these comments to the co-ordinating office.

Most of the resolutions require or rely on access to standard and reliable information and the processing of this information.

It is unfortunate that the presentation of the information model in Hobart was construed as a proposal for a large central ANPC database. It is rather an overall design of the information needs of the ANPC that will allow the participation, integration and coordination of dispersed projects. The use of distributed information will be essential for the survival of the ANPC in anything more than a series of conferences.

A proposal to limit ANPC database activities merely to a 'database of databases' would be extremely short sighted

and essentially a duplication of effort. There are already several environmental organizations in Australia developing or holding such data sets. If that is all that is required (and I do not believe that it is) it would be sufficient to augment these datasets. The ANPC should be looking towards a system where a question is asked by any of its members and the answers come from wherever in Australia the information happens to be.

To run the co-ordinating office will require lists of organizations, with all the information associated with the location and political/bureaucratic placement of that organization, contact people and address for various functions, individual participants and their contact details, affiliations, interests, contributions, skills, lists of plants that the ANPC is involved with or may want to become involved with, their taxonomic and bibliographic details, lists of sites involved with ANPC conservation programs, with information describing the site. The list goes on. We could perhaps debate the level of *detail* required in such an information system.

The proposal to create a national threatened species database working group with balanced representation from relevant groups is a valuable suggestion. Such a working group as well as giving guidance on priority information needs of the ANPC could also serve a role in disseminating network information standards to the groups they represent. I look forward to reading the results of this working group.

THE AUSTRALIAN NETWORK FOR PLANT CONSERVATION MEMBERSHIP LIST

The date (1994) indicates that the member has joined or renewed for that year. Addresses and names of contact persons are available from the National Office.

ACT Parks & Conservation Service, ACT
Botanic Gardens of Adelaide, SA
Albury Botanic Gardens, NSW
Alcoa of Australia Ltd., WA
Ian Anderson, ACT (1994)
Arid Land Botanic Garden, SA
Association of Societies for Growing Australian Plants
Australian Association of Bush Regenerators
Australian Forestry Council, Tas
Australian Mining Industry Council, ACT
Australian National Botanic Gardens, ACT
Australian Nature Conservation Agency
Australian Tree Seed Centre, CSIRO, ACT
Australian Trust for Conservation Volunteers
Peter Barrer, ACT (1994)
Mr Stephen Barry, Qld
Dr Robert Boden, ACT
Bonabro Central School, NSW
Botanic Gardens Conservation International, UK
Dr Barbara Briggs, NSW
Dr AHD Brown, ACT
Kate Brown (1994)
S Brunskill, Vic (1994)
Brunswick Valley Heritage Park, NSW
Miss Dulcie Buddee, NSW (1994)
Ms C Burke Qld
Mr R Burns, Tas (1994)
Burrendong Arboretum Trust, NSW
Dr G Burrows
Center for Plant Conservation, USA
Irene Champion, Qld (1994)
Anne Coates, WA
J A Cochrane, WA
Coffs Harbour City Council, NSW
CSIRO, Division of Plant Industry, ACT
Dept of Conservation & Land Management, WA (1994)
Conservation Commission of the Northern Territory
N & J Cowie, NSW (1994)
S Cropper (1994)
Deakin University, Rusden Campus Library, Vic
Department of Parks Wildlife and Heritage, Tas
Mr J Delpratt
Mr S Donaldson, ACT
Max Elliott, NSW
Eurobodalla Botanic Gardens, NSW
Elizabeth Fenton, Vic
Flecker Botanic Gardens, Qld (1994)

Julie Foster, ACT (1994)
Friends of the North Coast Regional Botanic Garden, NSW
Friends of the Points; Vic
Mr Warren Ganter, ACT
Mrs E George; WA
George Caley Botanic Garden; NSW
Ms. L Gilfedder; Tas
Gladstone Tondoon Botanic Gardens; Qld
Roger Good, NSW
Mr David Gordon; Qld
Dr Janet Gorst; Tas
Joanne Green, NSW
Scott Green, UK
Greening Australia (ACT)
Greening Australia (NSW)
Greening Australia (Vic)
Greening Australia (WA)
Mr Barrie Hadlow; ACT
Ms Laurel Hemming, Vic
Mr Peter Hind, NSW
Honiara Botanic Gardens; Solomon Islands
Hunter Region Botanic Gardens; NSW
Jan Heisler, NSW
Illawarra Zoological Society, NSW (1994)
Joseph Banks Native Plants Reserve, NSW (1994)
Gregory Jackson, ACT
Ms Susan Johnston, ACT
Kebun Raya Indonesia
Kingfern Natives; NSW (1994)
Kings Park and Botanic Gardens; WA
J Landsberg, ACT (1994)
Limpinwood Gardens Nursery, NSW
Mr. WJF McDonald; Qld
Alex Mackenzie NSW (1994)
Bob Makinson ACT (1994)
Mr. David Mason; NSW
Mt Coot-tha Botanical Gardens; Qld
Ms M Matthes, NSW
S Mattingley, ACT
J Meyer, TAS
G Mitchell, NSW
J Moffatt, Qld (1994)
Myall Park Botanic Garden, Qld
Sharon Nash, NSW
National Botanical Institute, South Africa
L Nieboer, Vic
M Noble, NSW
Norfolk Island Botanic Garden
NSW National Parks and Wildlife Service, Queanbeyan, NSW
NSW NPWS, Northern Region
North Forest Products; Tas
Olive Pink Flora Reserve; NT
M Oxford, SA
Dr. Bob Parsons; Vic
Mr Joe Pernier, NT (1994)
K Querengasser, Qld
Mr Brian Quinn, Vic
Randwick City Council, NSW
Rare Plant Consortium, Canada

Redlands Shire Council, Qld (1994)
S Rempel, Canada
Mr. Brett Robinson, NSW
Royal Australian Institute of Parks and Recreation, ACT
Royal Botanic Gardens, Melbourne, Vic
Royal Botanic Gardens, Sydney; NSW
Royal Tasmanian Botanical Gardens; Tas
Mrs Esma Salkin; Vic (1994)
Ms Marilyn Smith, NSW
H Smith, NSW
SGAP - Canberra Region Inc
SGAP - Dryandra Study Group
SGAP - East Hills Group
SGAP - Grampians Group; Vic
SGAP - Grevillea Study Group
SGAP - Maroonah Inc (1994)
SGAP - New South Wales Ltd.
SGAP - Newcastle; NSW
SGAP - North Coast; NSW
SGAP - North Shore; NSW
SGAP - North West; Tas
SGAP - Pine Rivers; Qld
SGAP - Queensland Region
SGAP - South Australia Region
SGAP - South West Slopes; NSW
SGAP - Tasmania Region
D Snape, Vic (1994)
Stony Range Flora Reserve, NSW (1994)
JH & IE Story, Qld (1994)
Sunraysia Oasis Botanical Garden, NSW
Suva Botanical Gardens; Fiji
D Swift, Tas (1994)
Jane Tarran, NSW
Tasmanian Arboretum Inc (1994)
R Taylor, USA (1994)
P Thomas, RBG Edinburgh
L Thompson, NSW (1994)
Threatened Species Network (NT)
Townsville Botanic Gardens; Qld
Tumut Ecology Reserve Trust; NSW
R Turner, ACT
Vailima Botanic Gardens; Western Samoa
VCAH Library, Burnley, Vic
VCAH Dookie, Vic
B Vanzella, NSW
Waite Arboretum, Vic
D Wallace, Vic
B Wannan, NSW
C Ward, NSW (1994)
Matt White, Vic (1994)
Wildflower Society of Western Australia
Wildflower Society of WA - Mandurah Branch
T Wilkinson, NSW
J & A Willinck, NSW
Mr. John Wrigley; NSW (1994)
Wollongong Botanic Gardens (1994)
World Wide Fund for Nature Australia
Zoological Parks Board of New South Wales
Zoological Board of Victoria (1994)

THE AUSTRALIAN NETWORK FOR PLANT CONSERVATION

Just over 200 hundred years of European settlement has had a severe impact on Australia's natural ecosystems. The current estimate of extinct plant species in Australia is more than 70, with more than 175 species endangered and another 3200 under some degree of threat.

Fortunately, the community is becoming more conscious of the need to protect global environments from the threats facing them. It is universally recognised that the preservation of habitat is the most desirable means of conserving the biological diversity of all organisms. However, some of these organisms are so threatened that the only means of saving them will be to secure them outside of their natural habitat until suitable places can be located to establish them. Some may have to be maintained permanently in ex situ collections. This complementary role for ex situ conservation is now being referred to as *integrated conservation*.

In March 1991 the Australian National Botanic Gardens (ANBG), with support from the Federal Endangered Species Program, held a conference entitled "*Protective Custody*". The aim of the Conference was to involve organisations and individuals interested in plant conservation and to encourage co-operation between these organisations by the formation of a co-ordinating body for plant conservation. Delegates from Britain, Fiji, New Zealand, Indonesia, the Solomon Islands, the United States of America and Western Samoa also attended the Conference.

During the Conference, consensus was reached that the Australian region does need a body to co-ordinate integrated plant conservation. A proposal for the formation of the Australian Network for Plant Conservation (ANPC) was later produced and widely accepted.

The ANPC draws its membership from throughout Australia (in both public and private sectors) and has a national office at the Australian National Botanic Gardens. It will be the co-ordinating organisation for integrated plant conservation in Australia. Its activities include :

- i) establishing a multi-site National Endangered Species Collection for use in the practical recovery of endangered species as well as for research, education, display and general horticulture.
- ii) locating and bringing together information on integrated plant conservation activities in Australia and providing access to this information for members.
- iii) assisting in the national co-ordination of plant conservation projects to avoid duplication of effort.
- iv) providing advice to members and promoting plant conservation activities.
- v) communicating on a regular basis by means of a newsletter.
- vi) organising workshops, training courses and conferences.

For further information on the ANPC please contact;

The Curator, Australian National Botanic Gardens,

PO Box 1777, Canberra, ACT 2601, Australia, phone (06) 2509509, fax (06) 2509528